

Nicholas A. Brown (SBN 198210)  
GREENBERG TRAURIG, LLP  
4 Embarcadero Center, Suite 3000  
San Francisco, CA 94111-5983  
Telephone: 415.655.1271  
Facsimile: 415.520.5609

Attorneys for Plaintiff Tigo Energy Inc.

UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA

TIGO ENERGY INC.,

Plaintiff,

v.

ALTENERGY POWER SYSTEMS INC.,  
ALTENERGY POWER SYSTEMS USA INC., and  
ZHEJIANG YUNENG TECHNOLOGY CO., LTD.

Defendants.

Case No. 3:20-cv-03622

**COMPLAINT  
FOR PATENT INFRINGEMENT**

1 Plaintiff Tigo Energy Inc. (“Tigo”) brings this complaint for patent infringement against  
2 Defendants Altenergy Power Systems Inc., Alternenergy Power Systems USA Inc., and Zhejiang  
3 Yuneng Technology Co., Ltd. (collectively, “Defendants”) and alleges as follows:

#### 4 NATURE OF THE ACTION

5 1. This is a civil action for patent infringement arising under the patent laws of the  
6 United States, 35 U.S.C. § 1 *et seq.*, including 35 U.S.C. § 271.

#### 7 PARTIES

8 2. Plaintiff Tigo Energy Inc. (“Tigo”) is a corporation organized under the laws of  
9 California, with its principal place of business in Campbell, California.

10 3. On information and belief, Defendant Altenergy Power Systems Inc. (“APS-CA”) is  
11 a California corporation having its principal place of business at 19925 Stevens Creek Blvd., Suite  
12 100, Cupertino, CA 95014.

13 4. On information and belief, APS-CA does business as “APsmart” and operates the  
14 website at [www.apsmartglobal.com](http://www.apsmartglobal.com).

15 5. On information and belief, Dr. Zhi-Min Ling is the Chief Executive Officer,  
16 President and co-founder of APS-CA, and Dr. Yuhao Luo is the Chief Technical Officer, Chief  
17 Financial Officer, and co-founder of APS-CA.

18 6. On information and belief, Defendant Altenergy Power Systems USA Inc. (“APS-  
19 WA”) is a Washington corporation having its principal place of business at 600 Ericksen Ave NE,  
20 Suite 200, Seattle, WA 98110.

21 7. On information and belief, APS-WA does business as “APsystems USA” and  
22 operates the website at [www.apsystems.com](http://www.apsystems.com).

23 8. On information and belief, Dr. Zhi-Min Ling is the Chief Executive Officer,  
24 President and co-founder of APS-WA, and Dr. Yuhao Luo is the Chief Technical Officer, Chief  
25 Financial Officer, and co-founder of APS-WA.

26 9. On information and belief, Defendant Zhejiang Yuneng Technology Co., Ltd.  
27 (“APS-China”) is a Chinese corporation that maintains a place of business at No. 1 Yatai Road,  
28 Nanhu District, Jiaxing City, Zhejiang Province, China,

10. On information and belief, APS-China does business as APsystems Yuneng, and operates the website at <http://china.apsystems.com>.

11. On information and belief, Dr. Zhi-Min Ling is the Chief Executive Officer, President and co-founder of APS-China, and Dr. Yuhao Luo is the Chief Technical Officer and co-founder of APS-China.

## PATENTS-IN-SUIT

12. Tigo has been a technology leader in photovoltaic safety for many years, and has been awarded many patents, including U.S. Patent Nos. 8,933,321 and 10,256,770 (collectively the “Patents-in-Suit”).

13. U.S. Patent Nos. 8,933,321 (“’321 Patent”) is titled “Systems and methods for an enhanced watchdog in solar module installations” and was duly and legally issued by the United States Patent and Trademark Office on January 13, 2015. Tigo is the owner and assignee of all substantial rights in the ’321 Patent, a copy of which is attached as Exhibit 1.

14. U.S. Patent Nos. 10,256,770 (“’770 Patent”) is titled “Systems and methods for an enhanced watchdog in solar module installations” and was duly and legally issued by the United States Patent and Trademark Office on April 9, 2019. Tigo is the owner and assignee of all substantial rights in the ’770 Patent, a copy of which is attached as Exhibit 2.

## JURISDICTION AND VENUE

15. This Court has subject matter jurisdiction over this patent infringement action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

16. On information and belief, this court has personal jurisdiction over APS-CA because it is a California corporation having its principal place of business at 19925 Stevens Creek Blvd., Suite 100, Cupertino, CA 95014 and has committed acts of infringement in this district.

17. On information and belief, this court has personal jurisdiction over APS-WA because it maintains a place of business at 19925 Stevens Creek Blvd., Suite 100, Cupertino, CA 95014 and has committed acts of infringement in this district.

18. On information and belief, this court has personal jurisdiction over APS-China because it has committed acts of infringement in this district.

19. Venue is proper in the Northern District of California pursuant to 28 U.S.C. §§ 1391 and §1400(b). Plaintiff Tigo resides in this district. On information and belief, Defendants have committed acts of infringement in this district, APS-CA resides in this district, and APS-WA maintains a place of business in this district.

### BACKGROUND

20. National Electric Code § 690.12 requires that photovoltaic system circuits “installed on or in buildings shall include a rapid shutdown function to reduce shock hazard for emergency responders.”

21. Tigo is a leader in module-level rapid-shutdown technology. Tigo’s products include module-level rapid shutdown units that are attached to photovoltaic panels, such as its TS4-A-F product. The Tigo TS4-A-F works in conjunction with a transmitter, such as the Tigo RSS (Rapid Shutdown System) Transmitter, in order to provide a photovoltaic system that complies with the rapid-shutdown requirements of National Electric Code § 690.12. Tigo’s TS4-A-F and RSS Transmitter products are pictured below:

Tigo TS4-A-F:



Tigo RSS Transmitter



22. Tigo also sells a RSS Signal Detector, which is testing device for sensing the power-line communication (PLC) signal sent from Tigo's RSS Transmitter to Tigo's UL-certified Fire Safety solutions, including the TS4-A-F product shown above.



23. Tigo has delivered more than 1 million rapid-shutdown products to end users.

24. On information and belief, Defendants copied Tigo's product line in order to enter into the business of offering for sale, selling, and distributing products designed to enable photovoltaic systems to comply with the rapid shutdown requirements of National Electric Code § 690.12.

25. Defendants' products include the APsmart RSD-S-PLC pictured below right. Like Tigo's TS4-A-F, the APsmart RSD-S-PLC is a module-level rapid shutdown unit that is attached to individual photovoltaic panels.

Tigo TS4-A-F:

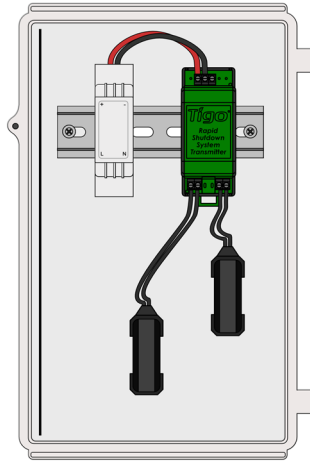


APsmart RSD-S-PLC

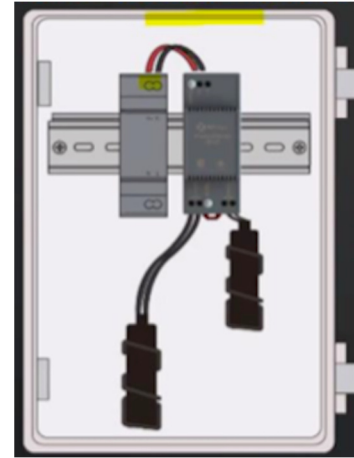


26. Defendants' products also include the APsmart Transmitter-PLC pictured below right. Like the Tigo RSS Transmitter, the APsmart Transmitter-PLC provides a "heartbeat" signal along the powerline to enable a photovoltaic system that complies with NEC § 690.12.

Tigo RSS Transmitter:

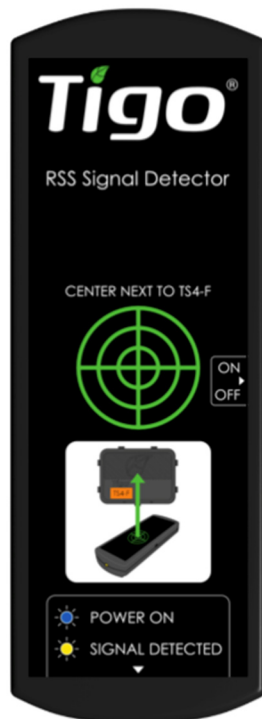


APsmart Transmitter-PLC

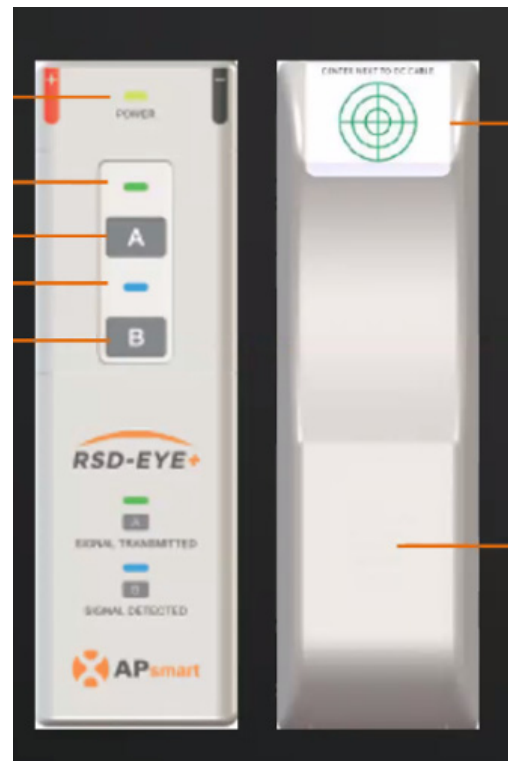


27. Defendants' products also include the APsmart RSD-EYE Detector pictured below right. Like the Tigo RSS Signal Detector, the RSD-EYE Detector is testing device for sensing the power-line communication signal sent from the transmitter to the module-level rapid shutdown unit.

Tigo RSS Signal Detector:

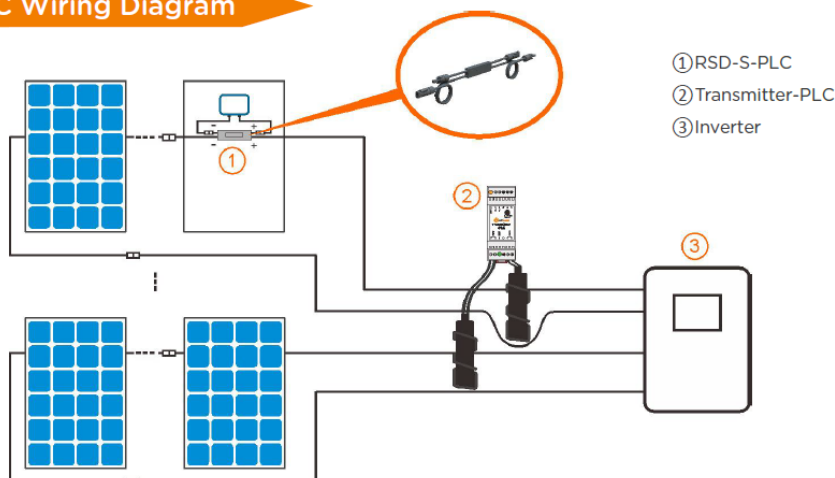


APsmart RSD-EYE Detector



28. On information and belief, the APsmart RSD-S-PLC is designed to be connected to a photovoltaic (“PV”) module in order to enable module-level rapid shutdown, and thus to enable PV modules to comply with National Electric Code § 690.12. As shown for example in the APsmart Rapid Shutdown System Installation/User Manual, Rev. 1.0 2019/09/11 (Exhibit 3, available at [https://apsmartglobal.com/wp-content/uploads/2019/09/RSDTransmitter-User-Manual\\_2019-9-11.pdf](https://apsmartglobal.com/wp-content/uploads/2019/09/RSDTransmitter-User-Manual_2019-9-11.pdf)) the APsmart RSD-S-PLC is a “PV module rapid shutdown unit” that is designed to be installed onto a PV module, and to be connected between the output of a PV module and the power line connecting a set of PV modules to an inverter:

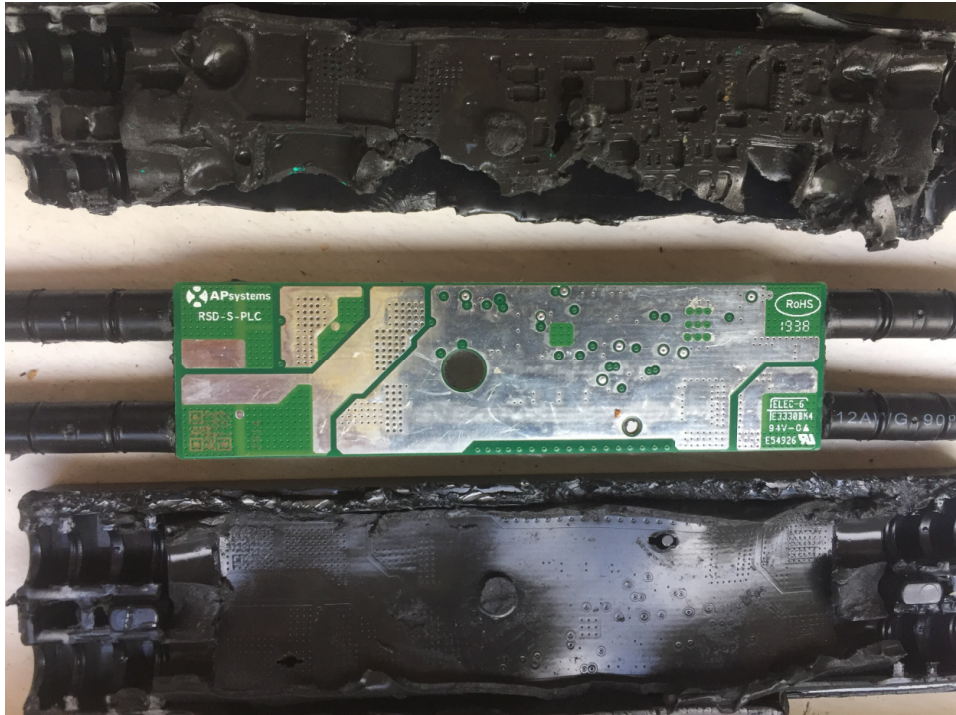
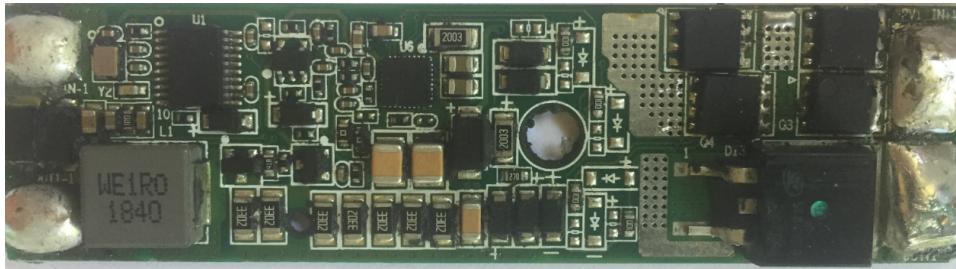
**RSD-S-PLC Wiring Diagram**



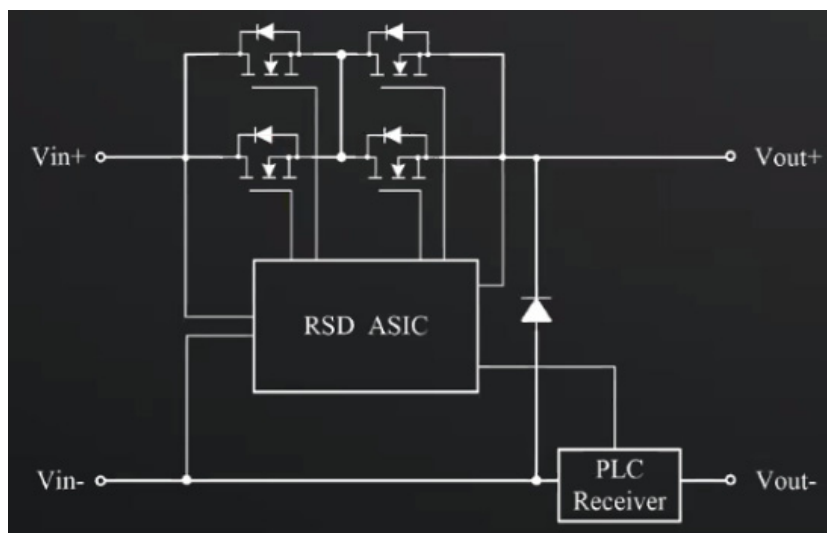
29. On information and belief, the RSD-S-PLC is designed to work with the APsmart Rapid Shutdown System (RSS) Transmitter-PLC product, as well as other compatible transmitters. While powered on, the RSS Transmitter-PLC or compatible transmitter sends a periodic “heartbeat” signal through the power line to the RSD-S-PLC units. While a RSD-S-PLC is receiving the heartbeat signal, it keeps its associated PV module(s) connected and supplying energy. When a RSD-S-PLC fails to receive the heartbeat signal for a period of time—approximately 7.5 seconds, which corresponds to approximately 7 missed signals—it “shuts down” its associated PV module, i.e. the RSD-S-PLC disconnects most or all of the power generated by associated PV module from the power line. After disconnection, the RSD-S-PLC then continues to monitor the power line for signals from the transmitter, and upon receiving the appropriate signal will reconnect the power generated by associated PV module to the power line.



30. The RSD-S-PLC contains a circuit board as shown by the photographs below:



A partial schematic of the circuit board in the RSD-S-PLC is shown below:





31. On information and belief, Defendants have made, used, sold, offered to sell, and/or imported RSD-S-PLC devices in the Northern District of California.

### COUNT ONE

#### Infringement Of The '321 Patent

32. Tigo restates and realleges each of the assertions set forth in the paragraphs above.

33. On information and belief, Defendants have infringed and continue to infringe one or more claims of the '321 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271, at least by without authority making, using, selling, offering for sale and/or importing the RSD-S-PLC and by inducing and/or contributing to infringement by others.

34. Claim 1 of the '321 Patent recites:

1. A system comprising:

a watchdog unit coupled between a solar module and a power bus, the power bus configured to connect a plurality of solar modules to an inverter, the watchdog unit having:

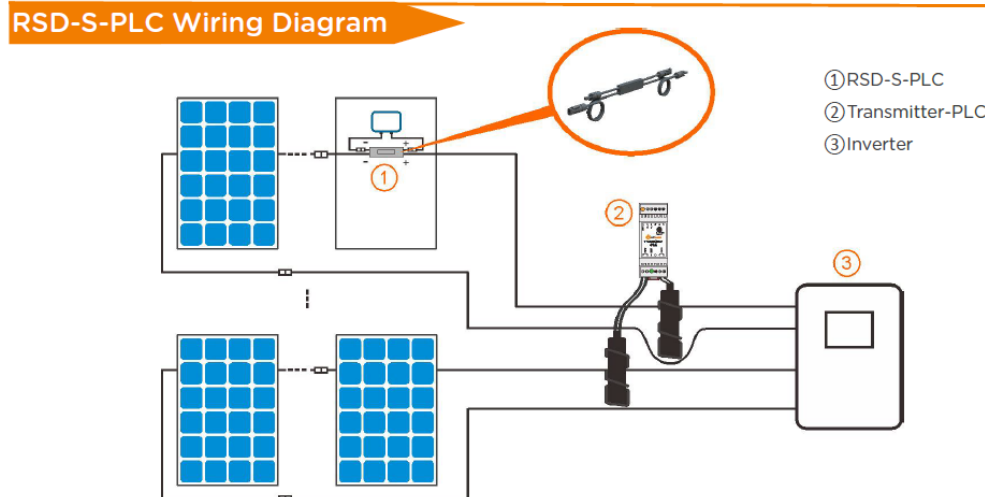
a local controller configured to monitor a communication from a central controller remote from the solar module and determine whether the communication has been interrupted for a time period longer than a predetermined number of allowed skips; and

at least one switch configured to disconnect the solar module from the power bus in response to a determination by the location controller that the communication from the central controller has been interrupted for a time period longer than the predetermined number of allowed skips;

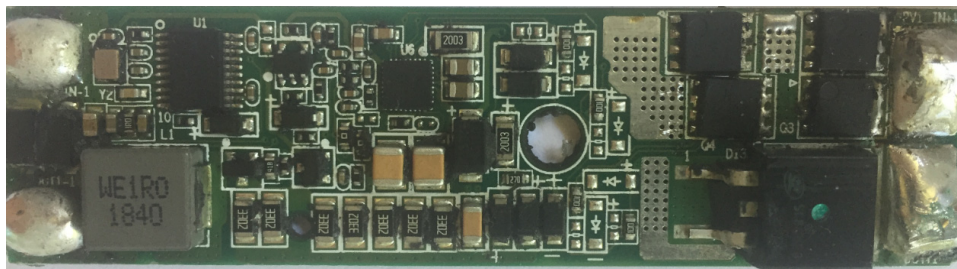
wherein the watchdog unit is configured to connect the solar module to the power bus when the communication is not interrupted.

35. On information and belief, the RSD-S-PLC is a watchdog unit that is designed and intended to be used in a system where it is coupled between a solar module and a power bus that is configured to connect a plurality of solar modules to an inverter. In particular, the RSD-S-PLC is part of a rapid-shutdown solution that receives a periodic signal from a transmitter such as the APsmart RSS Transmitter-PLC, that automatically enters rapid shutdown mode when the transmitter is switched off, and that resumes energy production when power is restored to the transmitter. As shown for example in the "RSD-S-PLC Wiring Diagram" contained in the

APsmart Rapid Shutdown System Installation/User Manual, the RSD-S-PLC is installed so that it connects a solar module to a power line that in turn connects multiple solar modules to an inverter.



36. On information and belief, the RSD-S-PLC contains a local controller configured to monitor a communication from a central controller remote from the solar module and determine whether the communication has been interrupted for a time period longer than a predetermined number of allowed skips. The RSD-S-PLC contains a local controller, as shown for example in the photograph below:



The RSD-S-PLC's local controller monitors a signal from a remote central controller. While it detects the presence of the signal, the RSD-S-PLC's controller keeps its associated solar module connected and supplying energy to the power line. When the RSD-S-PLC's local controller fails to receive the signal for a period of time—approximately 7.5 seconds, which corresponds to approximately 7 missed signals—it “shuts down” its associated solar module, i.e. the RSD-S-PLC opens at least one switch in order to disconnect the power generated by its associated solar module from the power line.

37. On information and belief, the RSD-S-PLC contains at least one switch configured

1 to disconnect the solar module from the power bus in response to a determination by the local  
2 controller that the communication from the central controller has been interrupted for a time period  
3 longer than the predetermined number of allowed skips. In particular, the schematic of the RSD-  
4 S-PLC shows that it contains at least one switch. When a RSD-S-PLC fails to receive the signal  
5 for a period of time—approximately 7.5 seconds, which corresponds to approximately 7 missed  
6 signals—it opens the switch(es) in order to disconnect the power generated by its associated solar  
7 module from the power line.

8 38. On information and belief, the RSD-S-PLC contains is a watchdog unit that is  
9 configured to connect the solar module to the power bus when the communication is not  
10 interrupted for more than the predetermined number of skips. In particular, while the RSD-S-  
11 PLC's controller detects that it has not failed to receive the signal for a period of time—  
12 approximately 7.5 seconds, which corresponds to approximately 7 missed signals—the RSD-S-  
13 PLC's controller keeps its switches closed so that the associated solar module is connected to the  
14 power line.

15 39. Defendants have had notice of and have been aware of the '321 Patent and their  
16 infringement of the '321 Patent at least since October 2, 2019, when Tigo sent Dr. Zhi-Min Ling  
17 a letter, copied to Dr. Yuhao Luo, notifying them of Defendants infringement of the '321 Patent.

18 40. By continuing to make, use, sell, offer to sell, and/or import the RSD-S-PLC after  
19 Defendants first had notice of Tigo's allegations of infringement, Defendants indirectly infringe  
20 and continue to indirectly infringe by active inducement one or more claims of the '321 Patent,  
21 including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(b). Defendants have  
22 done so by acts including but not limited to (1) selling, offering for sale, or importing the RSD-S-  
23 PLC which, when used as marketed and intended by Defendants, infringes the '321 Patent either  
24 literally or under the doctrine of equivalents; (2) marketing the infringing capabilities of the RSD-  
25 S-PLC; and (3) providing instructions, technical support, and other support and encouragement for  
26 the infringing use of the RSD-S-PLC. Defendant has performed and continues to perform these  
27 affirmative acts with knowledge of the '321 Patent and with the intent, or willful blindness, that  
28 the induced acts directly infringe the '321 Patent.

41. By continuing to make, use, sell, offer to sell, and/or import the RSD-S-PLC after Defendants first had notice of Tigo's allegations of infringement, Defendants indirectly infringe and continue to indirectly infringe by contributing to the infringement of one or more claims of the '321 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(c). Defendant's affirmative acts of manufacturing, selling, offering for sale, and/or importing the RSD-S-PLC, in this District and elsewhere in the United States, contribute to Defendant's customers and end-users directly infringing the '321 Patent with the RSD-S-PLC. The RSD-S-PLC is not a staple article or commodity of commerce, has no substantial non-infringing uses, and is known by Defendants to be especially made and/or especially adapted for use in infringement of the '321 Patent. Defendant has performed and continues to perform these affirmative acts with knowledge of the '321 Patent and with the intent, or willful blindness, that they cause the direct infringement of the '321 Patent.

42. On information and belief, Tigo has suffered and continues to suffer damages as a result of Defendants infringement of the '321 Patent in an amount to be determined at trial.

43. On information and belief, Defendants' infringement of the '321 Patent is causing irreparable harm for which Tigo has no adequate remedy at law unless Defendants are enjoined by this Court. Under 35 U.S.C. § 283, Tigo is entitled to a permanent injunction against further infringement of the '321 Patent.

44. On information and belief, Defendants have continued with their infringement after receiving notice from Tigo, despite the objectively high likelihood that their actions constitute infringement and Defendants' subjective knowledge of this obvious risk. As Defendants have no good faith belief that they do not infringe the '321 Patent, Defendants' continued infringement is willful and deliberate, entitling Tigo to increased damages under 35 U.S.C. § 284 and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

## COUNT TWO

### Infringement Of The '770 Patent

45. Tigo restates and realleges each of the assertions set forth in the paragraphs above.

46. On information and belief, Defendants have infringed and continue to infringe one

1 or more claims of the '770 Patent, including but not limited to exemplary claim 13, pursuant to 35  
2 U.S.C. § 271, at least by without authority making, using, selling, offering for sale and/or  
3 importing the RSD-S-PLC and by inducing and/or contributing to infringement by others.

4 47. Claim 13 of the '770 Patent recites:

5 12. A photovoltaic panel, comprising:

6 at least one photovoltaic cell; a local unit configured on the  
7 photovoltaic panel, the local unit having:

8 a voltage regulator coupled to the at least one photovoltaic cell to  
9 receive electric power generated by the at least one photovoltaic  
10 cell; and

11 a controller coupled to the voltage regulator;

12 wherein the voltage regulator provides a power output of the  
13 photovoltaic panel using the electric power generated by the at least  
14 one photovoltaic cell;

15 wherein the controller communicates with a remote unit, disposed at a  
16 location remote from the local unit, to control operations of the voltage  
17 regulator;

18 wherein the controller detects an anomaly in heartbeat signals from the  
19 remote unit; and

20 wherein in response to the anomaly, the controller causes the voltage  
21 regulator to reduce the power output of the photovoltaic panel.

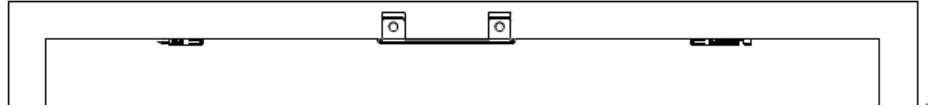
22 13. The photovoltaic panel of claim 12, wherein the anomaly includes  
23 skips of heartbeat signals.

24 48. On information and belief, the RSD-S-PLC is designed and intended to be installed  
25 onto a photovoltaic panel containing at least one photovoltaic cell, and to be a local unit configured  
26 on the photovoltaic panel. In particular, the RSD-S-PLC is designed and intended to be "installed  
27 anywhere on the PV module frame," for example on the front or back of the frame, using its  
28 integrated mounting brackets. Ex. 3 at 7.

A. Front buckle



B. Back buckle



49. On information and belief, the RSD-S-PLC contains a voltage regulator coupled to the at least one photovoltaic cell to receive electric power generated by the at least one photovoltaic cell and a controller coupled to the voltage regulator, wherein the voltage regulator provides a power output of the photovoltaic panel using the electric power generated by the at least one photovoltaic cell. In particular, the RSD-S-PLC contains a controller and circuitry which, when the “heartbeat” signal has not been received for a period of time (approximately 7.5 seconds, which corresponds to approximately 7 missed signals), “shuts down” the power output of the photovoltaic panel by regulating its output voltage to  $\sim 0.7V$ . However, when the “heartbeat” signal is being received by the RSD-S-PLC, the controller and circuitry connect the power output of the photovoltaic panel to the power line.

50. On information and belief, the controller in the RSD-S-PLC communicates with a remote unit, disposed at a location remote from the local unit, to control operations of the voltage regulator, wherein the controller detects an anomaly in heartbeat signals from the remote unit; and wherein in response to the anomaly, the controller causes the voltage regulator to reduce the power output of the photovoltaic panel, wherein the anomaly includes skips of heartbeat signals. In particular, the RSD-S-PLC contains a controller and circuitry which, when the “heartbeat” signal has not been received for a period of time (approximately 7.5 seconds, which corresponds to approximately 7 missed signals), “shuts down” the power output of the photovoltaic panel by reducing its output voltage to  $\sim 0.7V$ .

51. Defendants have had notice of and have been aware of the ’770 Patent at least since service of this complaint.



52. By continuing to make, use, sell, offer to sell, and/or import the RSD-S-PLC after Defendants first had notice of Tigo's allegations of infringement, Defendants indirectly infringe and continue to indirectly infringe by active inducement one or more claims of the '770 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(b). Defendants have done so by acts including but not limited to (1) selling, offering for sale, or importing the RSD-S-PLC which, when used as marketed and intended by Defendants, infringes the '770 Patent either literally or under the doctrine of equivalents; (2) marketing the infringing capabilities of the RSD-S-PLC; and (3) providing instructions, technical support, and other support and encouragement for the infringing use of the RSD-S-PLC. Defendants' continued performance of these affirmative acts with knowledge of the '770 Patent shows Defendants' intent, or willful blindness, that the induced acts directly infringe the '770 Patent.

53. By continuing to make, use, sell, offer to sell, and/or import the RSD-S-PLC after Defendants first had notice of Tigo's allegations of infringement, Defendants indirectly infringe and continue to indirectly infringe by contributing to the infringement of one or more claims of the '770 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(c). Defendant's affirmative acts of manufacturing, selling, offering for sale, and/or importing the RSD-S-PLC, in this District and elsewhere in the United States, contribute to Defendant's customers and end-users directly infringing the '770 Patent with the RSD-S-PLC. The RSD-S-PLC is not a staple article or commodity of commerce, has no substantial non-infringing uses, and is known by Defendants to be especially made and/or especially adapted for use in infringement of the '770 Patent. Defendant has performed and continues to perform these affirmative acts with knowledge of the '770 Patent and with the intent, or willful blindness, that they cause the direct infringement of the '770 Patent.

54. On information and belief, Tigo has suffered and continues to suffer damages as a result of Defendants infringement of the '770 Patent in an amount to be determined at trial.

55. On information and belief, Defendants' infringement of the '770 Patent is causing irreparable harm for which Tigo has no adequate remedy at law unless Defendants are enjoined by this Court. Under 35 U.S.C. § 283, Tigo is entitled to a permanent injunction against further

1 infringement of the '770 Patent.

2 56. On information and belief, Defendants have continued with their infringement after  
3 receiving notice from Tigo, despite the objectively high likelihood that their actions constitute  
4 infringement and Defendants' subjective knowledge of this obvious risk. As Defendants have no  
5 good faith belief that they do not infringe the '770 Patent, Defendants' continued infringement is  
6 willful and deliberate, entitling Tigo to increased damages under 35 U.S.C. § 284 and to attorneys'  
7 fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

8  
9 **PRAYER FOR RELIEF**

10 WHEREFORE, Tigo respectfully requests that the Court enter judgment in its favor  
11 against Defendants, granting the following relief:

- 12 a) A judgment that Defendants have infringed and are infringing the Patents-in-Suit.
- 13 b) A permanent injunction against Defendants and their affiliates, subsidiaries,  
14 assignees, employees, agents or anyone acting in privity or concert with them from  
15 infringing the Patents-in-Suit, including enjoining the making, offering to sell, selling,  
16 using, or importing into the United States products claimed in any of the claims of the  
17 Patents-in-Suit; using or performing methods claimed in any of the claims of the  
18 Patents-in-Suit; inducing others to use and perform methods that infringe any claim  
19 of the Patents-in-Suit; or contributing to others using and performing methods that  
20 infringe any claim of the Patents-in-Suit, until the expiration of the Patents-in-Suit.
- 21 c) An award of damages adequate to compensate Tigo for Defendants' patent  
22 infringement, and an accounting to adequately compensate Signify for the  
23 infringement, including not less than a reasonable royalty.
- 24 d) A judgment that Defendants' infringement the of the Patents-in-Suit was willful and  
25 that Defendants' continued infringement of the Patents-in-Suit is willful, and an  
26 award of damages to Tigo for Defendants' willful infringement;
- 27 e) An award of pre-judgment and post-judgment interest at the maximum rate allowed  
28 by law.

- 1 f) A judgment that this is an exceptional case and an award to of Tigo its costs, expenses,  
2 disbursements, and reasonable attorneys' fees related to Defendants' patent  
3 infringement under 35 U.S.C. § 285 and all other applicable statutes, rules and  
4 common law;  
5 g) An award of costs, and expenses as allowed by law; and  
6 h) Such other further relief, in law or equity, as this Court deems just and proper.  
7

8 **DEMAND FOR JURY TRIAL**

9 Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Tigo demands jury trial on  
10 all issues and claims so triable.  
11

12 DATED: June 1, 2020

**GREENBERG TRAURIG, LLP**

13 By: /s/ Nicholas A. Brown  
14

15 Nicholas A. Brown (SBN 198210)  
16 brownn@gtlaw.com  
17 GREENBERG TRAURIG, LLP  
18 4 Embarcadero Center, Suite 3000  
19 San Francisco, CA 94111-5983  
20 Telephone: 415.655.1271  
21 Facsimile: 415.520.5609

22 Counsel for Plaintiff Tigo Energy, Inc.  
23  
24  
25  
26  
27  
28